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Tungaloy Report No. 515-US

CBN with **Wavy Joint** technology achieves stable machining of hardened steels



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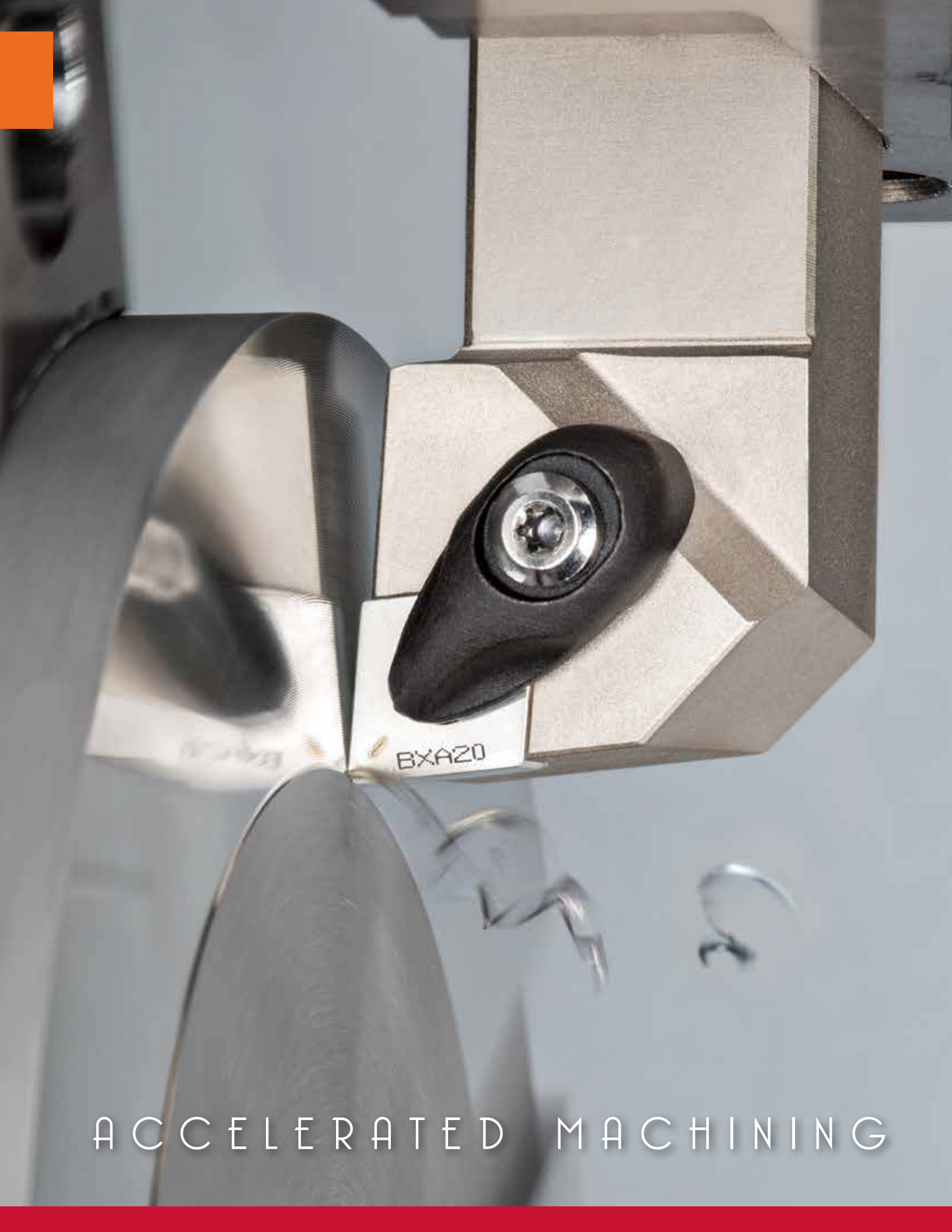
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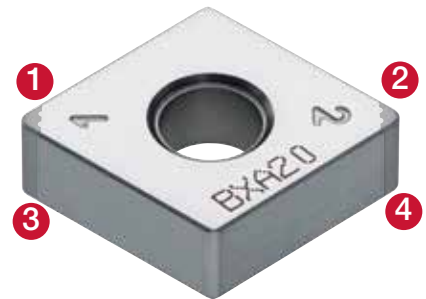
Increased brazing strength and CBN volume
For outstanding performance in hard turning applications.

For **high efficiency** hardened steel machining

New brazing technology for increased machining efficiency - "Wavy Joint"

- A maximum depth of cut up to 0.031"
 - Reduces the number of passes to increase productivity
- Innovative WavyJoint brazing technology
 - Prevents the CBN tips from debrazing, eliminating abrupt insert fractures during demanding dry machining, while securing stable and predictable hard turning operations.

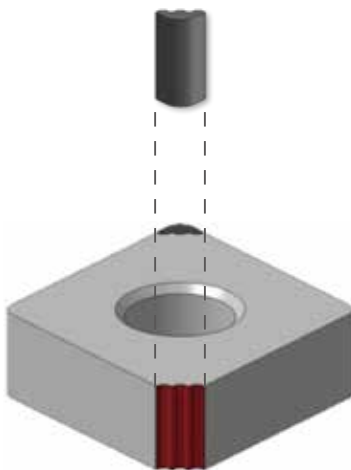
4 cutting edges



Wavy Joint BXA20

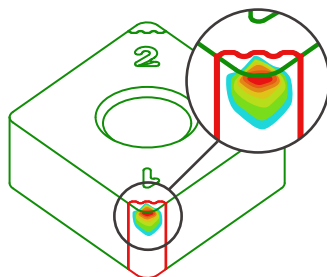
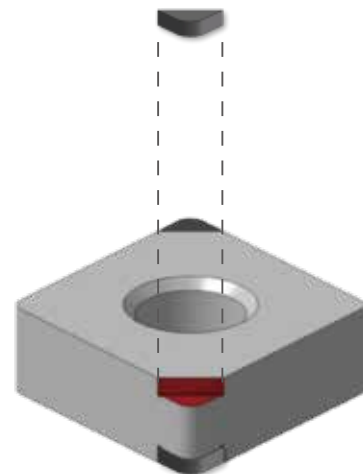
Vs.

Standard

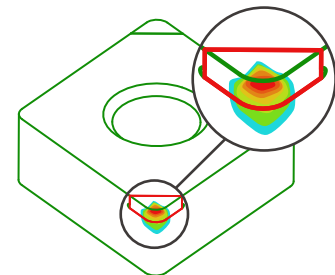


CBN tip size:
Up **200%** for improved heat control in the cutting zone

Brazing area:
Up **160%** for enhanced brazing strength



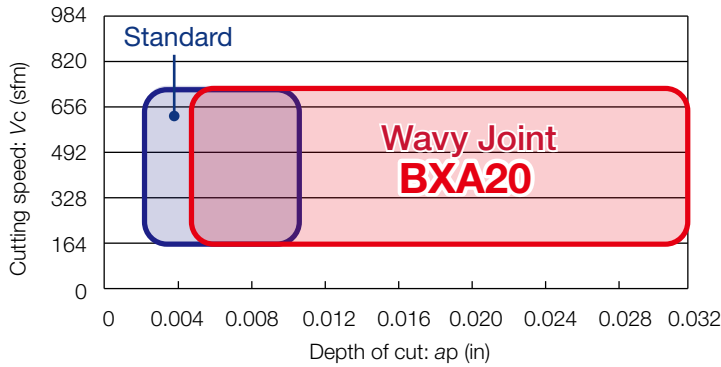
Temperature during machining is concentrated on the CBN tip, reducing temperature issues in the brazing zone.



Workpiece material : SCM420 / 20CrMo4 (60HRC)
Cutting speed : $V_c = 492$ sfm
Feed : $f_z = 0.008$ ipr
Depth of cut : $a_p = 0.030$ "
Coolant : Dry

APPLICATION

Hard Turning

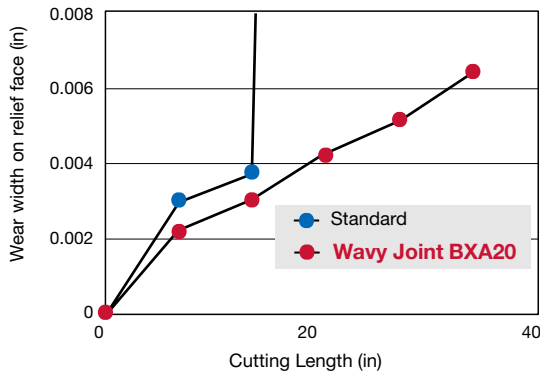


Wavy Joint BXA20

Great performance for continuous to heavy interrupted cutting at low and medium speeds.

CUTTING PERFORMANCE

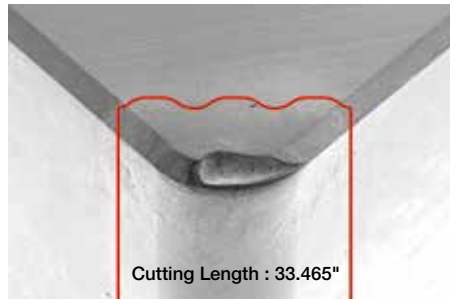
Effect of increased brazing area



Insert : Standard = 2QP-CNGM 432 HM BX20
 : Wavy Joint = 4QS-CNGG432-HM BXA20
 Workpiece material : SCM420
 Cutting speed : $V_c = 492$ sfm
 Feed : $f_z = 0.008$ ipt
 Depth of cut : $a_p = 0.030$ "
 Coolant : Dry





Standard



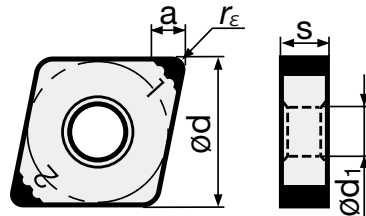
Wavy Joint BXA20

The WavyJoint technology prevents the braze from overheating due to the increase in cutting edge temperature during dry cutting, greatly improving the brazing strength. The result: stable machining and extended tool life.

INSERT

Feature	Shape	Designation		Grade	No. of corners	I. C. dia. ϕd	Thick-ness s	Hole dia. ϕd_1	Corner radius r_ϵ	CBN length a
				Coated						
		Inch	Metric	BXA20						
New		4QS-CNGG432-HM	4QS-CNGG120408-HM	●	4	0.500	0.187	0.203	0.031	0.059
		4QS-CNGG433-HM	4QS-CNGG120412-HM	●	4	0.500	0.187	0.203	0.047	0.067
Standard		4QS-CNGA432-H	4QS-CNGA120408-H	●	4	0.500	0.187	0.203	0.031	0.059
New		4QS-CNGA433-H	4QS-CNGA120412-H	●	4	0.500	0.187	0.203	0.047	0.067


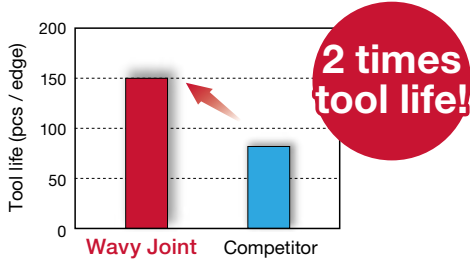
● : Line-up



STANDARD CUTTING CONDITIONS

ISO	Workpiece materials	Grade	Work condition	Cutting speed V_c (sfm)	Depth of cut a_p (in)	Feed f (ipr)
H	Hardened steel	BXA20	Continuous	164 - 722	0.005 - 0.031	0.004 - 0.012
		BXA20	Interrupted	164 - 656	0.005 - 0.031	0.004 - 0.008

PRACTICAL EXAMPLES

Workpiece type		Automotive part
Insert		4QS-CNGA433-H
Grade		BXA20
		SCM420
Workpiece material		
Cutting conditions	Cutting speed : V_c (sfm)	328
	Feed : f (ipr)	0.004 - 0.008
	Depth of cut : a_p (in)	0.028 - 0.039
	Coolant	Dry
Results		 <p>The Wavy Joint technology insert successfully machined 150 pcs/corner, almost twice that of the competitor's, without CBN tip failure.</p>

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